

Emissions Inventory Help Sheet for Reports Using EPA's TANKS 4.09d Program

This help sheet supplements “Instructions for Reporting 2007 Annual Air Pollution Emissions,” which you should refer to for additional information related to your report. This help sheet is for all facilities that use the EPA TANKS software program. You are expected to use the **most recent version, TANKS 4.09d**. All permitted sites at the 51st Avenue terminal are required to use the TANKS program. Newly permitted facilities with aboveground tanks larger than 15,000-gallon capacity also must use the TANKS program. Other facilities have the option of using the current TANKS program, or estimating emissions based on your 2006 report – see “Emissions Inventory Help Sheet for Large Aboveground Tanks.”

What do I have to report?

Report **volatile organic compound (VOC)** emissions on **Evaporative Process Forms**.

You should report or account for the following three categories of **aboveground tank-related** emissions:

- Working Losses – On the TANKS printout for floating roof tanks, this is called “withdrawal losses.”
- Standing Losses – On the TANKS printout for fixed roof tanks, this is called “breathing losses;” for floating roof tanks, this is the sum of “rim seal,” “deck fitting” and “deck seam losses.”
- Loading Emissions – Not calculated by the TANKS program, see pages 2-3 of this help sheet.
- A fourth category is for fugitive losses such as fittings, valves, pumps, etc. This help sheet does not address fugitive losses.

How do I calculate working and standing losses?

Use **TANKS 4.09d** to calculate working and standing loss emissions. The software program can be found at <http://www.epa.gov/ttn/chief/software/tanks/index.html>. If you need a copy of the software or help in running the program, contact the Emissions Inventory Unit at (602) 506-6790. In Maricopa County, gasoline RVP is regulated by month and should be reported at the different RVP's as applicable. You should use the higher RVP during transition times.

Please do not use previous versions of the TANKS program.

Working and standing losses are reported separately for each tank that meets any of the following criteria:

1. A tank which stored gasoline, or
2. A non-gasoline tank which had at least 100 pounds of working + standing annual emissions. It is satisfactory to base this determination on a prior year TANKS program calculation with the same product.
3. A non-gasoline tank that was modified or that stores a different product since the last run of a TANKS program.

How do I fill out the Evaporative Process Form for working and standing losses?

If your business submitted this report before, your Evaporative Process Forms should be preprinted in the correct format of descriptions and codes (although working loss emission factors may need to be changed). For tank changes or first-time reports, use a separate form for each *type* of aboveground tank, specifically the following: horizontal fixed roof, vertical fixed roof, internal floating roof, external floating roof, and domed external floating roof tanks. Each tank has two processes with separate process ID numbers. One process is “working losses” and the other is “standing losses.”

Print and enclose a “summary” report from TANKS 4.09d, which shows working and standing losses for each tank.

How do I determine the emission factors (EF) for working and standing losses?

Working loss emissions for a tank vary by throughput, so an EF for throughput is back-calculated. Show the number of gallons of throughput in column 9. Show the working loss emissions (calculated by TANKS 4.09d) in column 15.

Calculate the working loss emission factor for column 11 by dividing the working loss emissions by the number of gallons of throughput. This will give you an emission factor expressed in pounds per gallon (lb/gal). **Please update the pre-printed emission factor.**

Example: working loss emissions = 3,155 lb.
 total product throughput = 6,123,789 gal.
 EF = $3,155 / 6,123,789 = 0.000515$ lb/gal

Standing loss emissions: Report the EF as “1 lb/lb.” Enter pounds of total standing loss emissions (calculated by TANKS 4.09d) in both column 9 as the quantity measured and column 15 as the resulting emissions.

How do I fill out the Evaporative Process Form for loading emissions?

For loading using an emission control device other than vapor balance, the business which operated the control device must report loading emissions and pay related fees for all the users. If your products were loaded using someone else’s control device, identify in an attachment whose control device was used and how many gallons of your product were loaded using that device in 2007.

If your facility loaded product(s), for each product and each type of loading, enter the total gallons loaded in column 9 of the Evaporative Process Form. Then multiply the total gallons by the EF and enter the result in column 15.

Loading emissions are those vapors displaced when loading drums, tank trucks, rail cars, and fuel tanks of aircraft and vehicles. In addition, some sites have to report emissions from two loading transfers on site: first to a delivery truck, then to the aircraft or fleet vehicles. Each applicable emission factor needs to be reported as a separate process with a separate process ID number. Examples: All gasoline loaded into tank trucks using a particular control device would be shown as one process ID. Another process ID number would be assigned to all gasoline loaded into fleet vehicles from a tank truck. Other process ID numbers would be assigned to other fuels loaded into tank trucks, etc.

How do I determine the emission factors (EF) for Loading Emissions?

There are several ways to determine EFs for bulk loading.

1. If you had no vapor control device, you may use the default EFs in column D of Table 1: BULK LOADING DEFAULT EMISSION FACTORS, on the following page. This table covers standard fuels at Maricopa County average ambient temperature. They are calculated from the parameters shown in column C using the EPA equation shown afterward.
2. If you had no vapor control device, and if different products or different parameter(s) apply to your operation from what is given in Table 1, use the EPA equation shown on the next page and attach an Emission Factor Calculation Form showing how the EF was calculated.
3. If you used a vapor balance system to control vapors, use an EF from Table 1: BULK LOADING DEFAULT EMISSION FACTORS, or calculate one using the EPA formula. Show the reduction in emissions by entering 100% for capture efficiency and 90% for control efficiency in columns 13 and 14 of the Evaporative Process Form. The generic formula for this way of calculating emissions is:

$\text{gallons of throughput} \times \text{emission factor (lbs/gal)} \times [1 - (\% \text{ capture} \times \% \text{ control})] = \text{Emissions (lbs/yr)}$
or specifically in this case: $\text{gallons of throughput} \times \text{emission factor} \times 0.1 = \text{Emissions (lbs/yr)}$

4. If you used a condenser or thermal oxidizer vapor control device, use a pound-per-gallon EF derived from annual test results for your system. Use the highest EF value if there were multiple tests during the year. If there was no test done during the year, use the EF from the most recent test results. Attach test identification, date and summary of emission test results. If a pound-per-gallon EF is not shown on the summary of test results, attach an Emission Factor Calculation Form showing how the EF was calculated.

Provide a vapor control device ID number on the Control Device Form. Enter the control device ID number on the Evaporative Process Form, but do not enter capture or control efficiencies, since the EF already accounts for capture and control. Fill out a Stack Form if required.

Table 1: BULK LOADING DEFAULT EMISSION FACTORS

A. PRODUCT	B. TRANSFER TO	C. PARAMETERS				D. EMISSION FACTOR (LB/GAL)
		T	P	S	M	
Gasoline (10 RVP or less):	Tank trucks	535	6.8	1	66	.01050
	Rail cars	535	6.8	0.6	66	.00630
Avgas (6 RVP):	Tank trucks	535	4.0	1	68	.00636
	Rail cars	535	4.0	0.6	68	.00382
	Aircraft	535	4.0	1.45	68	.00923
JP-4/Naphtha:	Tank trucks	535	1.8	1	80	.00337
	Rail cars	535	1.8	0.6	80	.00202
	Aircraft	535	1.8	0.6	80	.00202
Kerosene, Jet A, or #1 Diesel:	Tank trucks	535	0.013	1	130	.00004
	Rail cars	535	0.013	0.6	130	.0000237
	Aircraft	535	0.013	0.6	130	.0000237
#2 Fuel Oil, or Diesel:	Tank trucks	535	0.0105	1	130	.0000319
	Rail cars	535	0.0105	0.6	130	.0000191
#6 Fuel Oil:	Tank trucks	585	0.0007	1	190	.0000031
	Rail cars	585	0.0007	0.6	190	.0000019
Crude Oil (5 RVP):	Tank trucks	535	3.7	1	50	.00433
	Rail cars	535	3.7	0.6	50	.00260

EPA equation to calculate Loading Loss (L_L) emission factor if not by stack test. (Source: EPA AP-42, Jan. 1995, Sec. 5.2.)

Use this equation for products or parameters other than those given in the table above. Reference South Coast Air Quality Management District for choice of "S" parameters. "M" and "P" are interpolated at 75°F from AP-42 Table 7.1-2 (11/06 p.7.1-63) except Avgas.

$$L_L = 12.46 \times \frac{S \times P \times M}{1000 \times T} \text{ lb/gallon loaded}$$

where: L_L = Loading loss before controls
S = Saturation factor:

For Tank Trucks and Rail Cars	S =
Submerged loading of clean cargo tank	0.50
Submerged loading: dedicated [same fuel] normal service	0.60
Submerged loading: dedicated [same fuel] vapor balance service	1.00
Splash loading of a clean cargo tank	1.45
Splash loading: dedicated [same fuel] normal service	1.45
Splash loading: dedicated [same fuel] vapor balance service	1.00

P = True vapor pressure of liquid loaded, psia, at actual temperature

M = Mol. Wt., lb/lb mole (condensed vapors), at actual temperature

T = Temperature (°R) of bulk liquid loaded, °R = °F + 460 (metro. Phoenix average temp = 72.5875°F)

GENERAL NOTES

- Pay attention to TANKS 4.09d messages if they indicate significant discrepancies in volume or turnover calculations. Corrections to tank measurements may be needed. These messages may also appear when running the report.
- If the contents of a tank were changed during the year, TANKS4.09d can accommodate the different products. Contact the Emissions Inventory Unit at (602) 506-6790 for additional guidance on reporting (ID numbers, etc.).
- **Excess emissions and accidental releases.** These emissions happen during down-time or malfunctioning of control devices or from leaks or spills. Such emissions must be reported to the Department immediately when they occur as well as in this annual report. Show the total on the “Accidental Releases” line of the Data Certification / Fee Calculation Form, or Data Certification Form.

CHECKLIST

Your 2007 report needs to include the following:

- Business Form
- Evaporative Process Form for each type of tank. (Additional blank forms are available from our web site, at http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/Default.aspx)
- TANKS 4.09d Summary Report printout
- Loading alternatives:
 - a) If your product was loaded using an emissions control device operated by another company, supply an attachment showing the number of gallons of each product which was so loaded and name the company responsible for the control device.
 - b) For all other product loading, provide at least one Evaporative Process Form for loading. Also (if applicable) include a summary of test results or an Emission Factor Calculation Form showing how the emission factor was calculated.
- Additional Evaporative or General Process Forms if you had any other types of emissions, such as tank purging, equipment leaks, pumpback emissions or combustion emissions.
- A **signed** Data Certification/Fee Calculation Form for issued or pending Title V permits **OR**
- A **signed** Data Certification Form for issued or pending Non-Title V permits.
- Fee payment (**ONLY** applicable for issued or pending Title V permits).